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DENTAL MANAGEMENT OF THE 'GAGGING' PATIENT – AN UPDATE

Claire Forbes-Haley¹, Ian Blewitt², James Puryer³

1. Bristol Dental Hospital, Lower Maudlin Street, Bristol, United Kingdom

2. Kings College London, Guy's Hospital, St Thomas Street, London

3. School of Oral and Dental Sciences, Bristol Dental Hospital, Bristol, United Kingdom

ABSTRACT:

The gag reflex is a normal response for patients, designed to protect the airway and remove irritants from the posterior oropharynx and the upper gastro-intestinal tract. However, some patients have an increased gag reflex which presents many challenges for both dentist and patient. Empathy and patience is needed, in addition to an appropriate treatment plan and clinical technique. This paper describes the gag reflex, its clinical significance and a range of management and treatment strategies in order to produce a successful treatment outcome.

Keywords: Gagging, Patient, Management, Treatment



INTRODUCTION:

An increased gag reflex presents many challenges for dentists and patients. It is important to have empathy and understanding with this problem even though at times it can be frustrating for both clinician and patients. Development of an appropriate chairside manner and creation of a calm environment within the dental surgery can act as an aid.

Identifying the severity of the problem allows a clinician to establish if the patient can cope with regular treatment strategies, or if alternative methods need to be considered. Better understanding of the difficulties associated with treating patients with an increased gag reflex can help clinicians develop new techniques and strategies for its management.

What is the gag reflex?

The gag reflex is a normal response for patients as a physiological mechanism, defined as *"an involuntary contraction of the muscles of the soft palate or pharynx that results in retching"*.^[1] It is a protective reflex, designed to protect the airway and remove irritants from the posterior oropharynx and the upper gastro-intestinal tract.

This process is modulated by afferent and efferent fibres passing to and from the medulla oblongata. Table 1 demonstrates origins of afferent impulses and destinations of efferent impulses.^[2]

Furthermore, neural pathways from the gagging centre to the cerebral cortex allow the reflex to be modified by higher centres. As a result, many patients have a reduced or absent reflex which does

*Corresponding Author Address: Dr James Puryer Email: james.puryer@bristol.ac.uk

not complicate dental treatment, whilst in others it can be very pronounced.

Gagging can be categorised simply as either *psychogenic* or *somatic* in origin.

[3] *Somatic* gagging can be triggered by touching areas of the oral cavity specific to the individual. Five intraoral areas are known to be “trigger zones”: palatoglossal and palatopharyngeal folds, base of tongue, palate, uvula, and posterior pharyngeal wall. [4]

Psychogenic gagging can be induced without direct physical contact and some patients may have their gagging reflex induced by simply the sight, smell or sound of the dental surgery. In its most severe form, simply the thought of dental intervention can induce gagging. [5, 6] Gagging can be further classified by severity relating to dental treatment shown in Table 2. [7]

Challenges to the patient:

For patients with a strong or hypersensitive gag reflex the idea of attending the dentist can be daunting. Some patients can struggle with everyday brushing and usually adapt their brushing in a manner to avoid gagging, with the result that some areas of the dentition may rarely be subjected to oral hygiene measures.

The somatic influences can be different for each patient. There is usually a trigger point, area or zone that stimulates the reflex. Management of these patients is difficult as there is no ‘one size fits all’ solution. Triggers can

also change according to who is placing items in the mouth and for what purpose. For example, the majority of patients with Grade V gag reflexes are able to eat normally as they are in control. As soon as another person aims to imitate this by placing a probe or mirror in the mouth the gag reflex can be triggered.

The psychogenic origins of the gag reflex can strongly effect the severity of the response to stimuli. There is a spectrum of responses and these are described in Table 2. The spectrum runs from those who are able to control their reflex to allow treatment, all the way to patients who gag even thinking about attending the dentist. The anxiety that accompanies this problem usually creates an additive effect to the gagging response. Controlled exposure and behaviour management can help to control some patients’ gag reflex, reinforcing the idea that the problem is more psychological than physical. [8]

Challenges to the dentist:

Most patients are aware they have a strong gag reflex and will let their dentist know before an examination, but some are embarrassed and try and hide the problem. Knowing that a patient is prone to gagging will change their management, and so identifying these patients before treatment commences is important. Once ‘at risk’ patients have been identified by careful history taking, a ‘Gagging Problem Assessment Questionnaire’ may useful to help

predict an individual patient's sensitivity to dental treatments. ^[9]

Some techniques have been suggested to help classify the gagging of a patient, for example slowly stepping back a blunt ended burnisher along the palate to see when a reflex is elicited. This can help to guide appropriate management, as can the use of a severity index. Identifying 'trigger zones' and managing them appropriately will not only increase patient comfort, but will help patient tolerance as their treatment progresses. For some patients, anaesthetising 'trigger zones' can increase patient compliance. ^[10]

The anxiety of affected patients is usually elevated. They may associate treatment with negative experiences and can arrive for treatment expecting it to fail. As a dentist, it is important to have both empathy and understanding. Development of an appropriate chairside manner and creation of a calm environment within the surgery can be very beneficial. Identifying the severity of the problem allows a dentist to establish whether the patient can cope with regular treatment strategies or if alternative methods need to be considered. These patients generally require longer appointments so they are not rushed and are able to take breaks during the examination or treatment, if required. Good communication of the dental problem and the proposed treatment plan is also needed. If patients are given a breakdown of treatment stages and what would be happening at

each visit, this can help them to prepare mentally. This forward planning can be difficult, and along with lengthier appointment times and additional management of the patient, longer treatment times and delayed completion may ensue. However, rushing these patients is not effective and is often counterproductive, thus the potentially heavier workload needs to be accepted.

Dental management strategies:

Many strategies have been advocated to try and alleviate or reduce gagging in patients. Dickenson and Fiske ^[11] suggested that these strategies fall into a number of categories:

a) **Relaxation techniques** such as listening to music, use of dimmed lighting and avoiding the sight of dental instruments (passive relaxation) can be used in conjunction with controlled rhythmic breathing or relaxed abdominal breathing (active relaxation).

b) **Distraction techniques** can be used for short-term management, and techniques suggested include talking to the patient, asking the patient to concentrate on keeping their leg raised from the chair, tapping their temple, placing salt on their tongue, closing their eyes and rinsing their mouth with ice-cold water.

c) **Desensitisation techniques** may lead to a more permanent improvement in patient tolerance of dental treatment. Suggestions include repeated stroking or brushing of the tongue or anterior soft

palate with a finger, swallowing with the mouth open, and carrying out 'dental homework' with borrowed dental instruments.

Additional complementary therapies may also be beneficial:

1) **Acupuncture:** This has an important role to play in improving the quality of care that can be delivered for dental patients, particularly around the management of the gag reflex. ^[11] Acupuncture of point CV-24 has been shown to be an effective method of controlling a severe gag reflex during dental treatment, including impression taking. ^[12] Ear acupuncture has also been successful in controlling the gag reflex. It is a safe, quick, inexpensive and relatively non-invasive technique ^[7] although additional training is required for most dentists.

2) **Acupressure:** This utilizes pressure points without piercing the skin. Application to the pressure point during dental procedures has been shown to decrease the likelihood of triggering a gag reflex. ^[14, 15]

3) **Trans-cutaneous electrical nerve stimulation (TENS):** A preventive approach suggests that the sensory stimulation of the cranial nerves of the superior laryngeal nerve branch, (Cranial nerve IX, pharyngeal branch of Cranial nerve X, Cranial nerve V, and Cranial nerve X) would block the physiologic response of gagging and retching. ^[16]

4) **Hypnosis:** Management by hypnotherapy using a systematic desensitisation technique allows for extraction of teeth and permanent elimination of the gagging problem, whilst 'hypnopuncture' (a combination treatment of both hypnosis and acupuncture) can provide a therapeutic treatment plan for long-term therapy for patients with a distinctive gag reflex. ^[17, 18]

5) **Psychological and Behavioural Therapies:** can be useful to help patients manage their gag reflex and suggested techniques include ego enhancement, confidence reinforcement, mock rehearsals of the treatment and the use of biofeedback.

6) **Pharmacological Agents:** The use of local anaesthesia (injection or topical), relative analgesia (inhalation sedation), IV sedation and even general anaesthesia may be warranted for the treatment of some patients. Relative analgesia (inhalation sedation) may be employed to facilitate the taking of dental impressions in patients with an increased gag reflex. ^[19] The greater the severity of the gag reflex, the more often intravenous sedation or general anaesthesia is required due to difficulty in desensitisation of the patient. It has been suggested that determining whether it is possible to examine the molar area without inducing the gag reflex will offer the key to deciding the most appropriate treatment strategy. ^[20]

7) **Miscellaneous techniques:** There are also a number of modifications that can be made to a treatment plan that dentists may find useful, and these include: using rubber dam to overcome a patient's worry about swallowing or inhaling debris, using sectional rather than full impression trays, using lower impression trays in the upper arch and using special trays for impressions.

Treatment involving fixed and removable prostheses:

A simple examination or even a single tooth restoration may be undertaken successfully for patients with an increased gag reflex if management techniques described above are followed. However, for those patients needing replacement of multiple teeth, and who require removable prosthesis or implant retained crowns/bridges, even using the described techniques may not be enough to allow these patients to easily tolerate more complex impressions or any prostheses. This can often lead to patients abandoning treatment and going without a prosthesis, leading to a sense of frustration for both patient and clinician. Some patients struggle to have any teeth beyond a shortened dental arch, even with a fixed prosthesis. As patients can function in a shortened dental arch, it may be more appropriate to treat to this concept as a standard for those patients with a severe gag reflex.

Adaption to tooth replacement can be used to help avoid a gag reflex, and

different approaches to treatment and design of prostheses can help to work around an increased gag reflex:

- Home management techniques, such as practice placement of impression trays for lengthening periods of time to allow tolerance via a process of desensitisation.
- Using a solid mix of impression materials or rapid setting materials (such as impression compound) to subject the patient to a reduced exposure time.
- Using customised trays, utilising the potential to reduce and limit the palatal extension. ^[21]
- Using training plates or a conditioning appliance, in order to allow the patient to slowly adapt to managing a foreign body in their mouth and hopefully to wearing a denture. ^[22]
- Provision of a well-fitting prosthesis to avoid the most common causes of gagging including looseness/rocking of the denture, excessive thickness in the palate or the posterior border of the upper denture, or a narrow arch form which places the cusps of the upper posterior teeth closer to the dorsum of the tongue. ^[23]
- Provision of multiple post dams on the finished upper denture base so as to allow adjustment to the patient's preference. This is important because having an inadequate post dam can produce gagging as a result of too little pressure being applied to the palatal tissue. When a post dam is too

shallow there is lighter pressure which can produce a 'tickling' sensation which elicits a gag. However, over-extended borders on maxillary dentures and the distolingual part of a mandibular denture may impinge on 'trigger areas' and cause gagging.^[24]

- Using the shortened dental arch concept or an extremely shortened arch concept (first premolar only) or even canine to canine only, to provide some function when restoring, therefore avoiding over-extension and reduction in the chance of stimulation of the gag reflex.^[25]
- Planning a 'horse-shoe' shaped major connector reduces palatal coverage, thereby providing less interference for the tongue.^[10]
- Providing a textured palatal surface to recreate the normal anatomy of palate to make the prosthesis feel less foreign.
- Using the remaining natural teeth and the provision of tooth-supported dentures to aid retention and stability, thus allowing reduction in the overall size and coverage of soft tissues.
- Using sectional dentures to allow a reduction in their size by better utilisation of undercuts,^[26] with special consideration for the method of retention, and to carefully avoid sizes that could pose as an obstruction risk (inhalation or swallowing).

- Providing a buccal denture (a gingival veneer with teeth on) using the support of the labial soft tissues and undercuts around the cervical margins.^[27]
- Providing a 'suck down' denture, or Essix-style retainer using the support of the remaining dentition and avoiding soft tissue contact.
- Providing implant-retained prostheses to allow a reduction in prosthesis size and extension.

Sadly, for some patients with a severe gag reflex and no remaining dentition, treatment with implant supported prostheses could be the only successful solution, despite often having spent many years struggling with traditional prosthetic techniques. Due to restrictions on funding within the National Health Service, ultimately patients may have to rely on their savings in order to overcome this problem. Some special circumstances can qualify for individual funding panel applications but these situations are few and far between and all standard techniques must have been previously fully exhausted.

CONCLUSIONS:

A gag reflex is meant to protect us but for some individuals with an exaggerated response, it becomes more problematic than protective, interfering with their everyday life, normal function and routine. For those who find it hard to brush their teeth due to their sensitive gag reflex, they may eventually find themselves in the difficult position of

needing tooth replacement when their natural teeth succumb to caries or periodontal disease. Difficulty in providing treatment then continues to compound the problem, which in turn gives them a negative association with dental treatment.

Patience and empathy are paramount, and identification of these patients and taking time to help them tackle their problem while explaining that others

also have similar issues can be reassuring. If any fear of the dentist and dental treatment can first be overcome then management of the reflex can be more successful. Utilising some of the techniques and methodically working through all treatment options described in this paper may help both clinician and patient to achieve a successful treatment outcome.

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TABLES:

Cranial Nerve	Afferent region	Efferent region
Trigeminal nerve (V)	Lips Buccal surface of cheeks Anterior two-thirds of tongue Soft palate Sublingual region	Muscles of mastication Mylohyoid muscle Tensor palatini muscle
Glossopharyngeal nerve (IX)	Posterior third of tongue Part of pharynx	
Vagus nerve (X)	Epiglottis Pharynx Larynx above vocal cords	Larynx
Facial nerve (VII)		Muscles of the lips
Pharyngeal plexus (IX, X and XI)		Fauces Palate Pharynx
Hypoglossal nerve (XII)		Tongue
Various sympathetic and parasympathetic nerves		Diaphragm Abdominal muscles Neck and shoulder muscles Salivary glands Lacrimal glands Sweat glands

Table 1: Origins of afferent and efferent nerves involved with the gag reflex

Grade I	Normal gagging reflex. Very occasional gagging occurs during high-risk dental procedures such as maxillary impression taking or restoration to the distal, palatal or lingual surfaces of molar teeth. This is basically a 'normal' gag reflex under difficult treatment circumstances. Generally controlled by the patient.
Grade II	Mild gagging. Gagging occurs occasionally during routine dental procedures such as fillings, scaling and impressions. Control can usually be regained by the patient, but may need assistance and reassurance from members of the dental team, and treatment continued. No special measures are generally needed to facilitate routine treatment but may be required for more difficult procedures.
Grade III	Moderate gagging. Gagging occurs routinely during normal dental procedures. This may include simple physical examination of high-risk areas, such as the lingual aspect of lower molars. Once instigated, control is difficult to regain without cessation of the procedure. Re-commencement may be difficult. Gagging prevention measures are usually required. The gag may influence treatment planning and may limit treatment options.
Grade IV	Severe gagging. Gagging occurs with all forms of dental treatment including simple visual examination. Routine treatment is impossible without some form of special measure to attempt to control the gag reflex. Treatment options may be limited and the gagging problem will be a major factor in treatment planning.
Grade V	Very severe gagging. Gagging occurs easily and may not necessarily require physical intervention to trigger the reflex. The patient's behaviour and dental attendance may be governed by the gagging problem and it will be one of the prime factors when planning treatment. Treatment options may be severely limited. Dental treatment will be impossible to carry out without specific, special treatment for control of the gagging problem.

Table 2: The gagging severity index. [7]